

United States Environmental Protection Agency
Region II
POLLUTION REPORT

Date: Wednesday, August 01, 2007

From: Thomas Budroe

To: Beckett Grealish, USEPA Region 2, ERRD, Thomas Budroe, US EPA Region II RAB
Tim Grier, USEPA Headquarters 5202G Mary Mears, USEPA, Region 2, PAD
David McLeod, USEPA, Region 2 CID Delmar Karlen , USEPA Region 2
ORC-NJSFB
Carole Petersen, USEPA, Region Paul Zammit , USEPA Region 2 OIG
2ERRD-NJRB
George Zachos, USEPA Region 2 ERRD Andrew Raddant, Department of Interior
Juan Fajardo, USEPA Region 02 Joe Rotola, USEPA Region 02
Fred Mumford, NJDEP Eric Wilson, USEPA

Subject: United States Environmental Protection Agency
Bergen Perchlorate Ion Site
Saddle River, Upper Saddle River, Woodcliff Lake, NJ

POLREP No.:	1	Site #:	WW
Reporting Period:		D.O. #:	048
Start Date:	6/4/2007	Response Authority:	CERCLA
Mob Date:	6/6/2007	Response Type:	Time-Critical
Demob Date:		NPL Status:	Non NPL
Completion Date:		Incident Category:	Removal Action
CERCLIS ID #:	NJC200400133	Contract #	EP-W-04-054
RCRIS ID #:			

Site Description

1. Site Location

The Site consists of a groundwater aquifer contaminated with perchlorate. The location of the Site is currently defined as the communities of Saddle River Borough, Upper Saddle River Borough, Park Ridge Borough and Woodcliff Lake Borough, Bergen County, New Jersey in a residential area. The extent of the perchlorate contamination in the groundwater has not been delineated, and the Site may expand as additional data are received and evaluated.

Homes constructed over much of the Site were built in the 1960s. Previous to housing, much of this area was reportedly farmed as apple, peach and cherry orchards as well as strawberry fields.

Perchlorate contamination has impacted the semiconfined bedrock aquifer within the Brunswick

Formation of the Newark Group. The Brunswick Formation is composed of mudstone, siltstone and sandstone, and is a major source of potable water for much of Bergen County. The Newark Group generally strikes north-northeast and dips to the west-northwest at 10 degrees in this area. In the Brunswick Formation, groundwater is stored and transmitted through a series of interconnected joints, fractures and solutions channels collectively referred to as secondary porosity. This secondary porosity decreases with depth. As a result, only the upper 200 to 500 feet of the Brunswick Formation is considered an aquifer. Groundwater flow tends to be anisotropic with a principal direction of flow parallel to strike. Groundwater flow velocities in fractured rock aquifers are generally much higher than in unconsolidated aquifers; and high yielding wells can draw groundwater from distances much farther (up to several miles) than similar wells in unconsolidated formations.

2. Description of threat

There has been and continues to be a release of perchlorate in and through the groundwater at the Site. The U.S. Environmental Protection Agency's (EPA's) well water sampling results, in addition to results from other agencies, has demonstrated a pervasive presence of perchlorate in groundwater in the semiconfined bedrock aquifer.

To date, over 150 residential wells surrounding Municipal Well 10 have been sampled in total by local, State and Federal agencies. Perchlorate was found above the detection limit in wells over two miles west of Municipal Well 10. Most of the wells sampled are located west of the Garden State Parkway. Of the wells sampled, approximately 75% had a perchlorate concentration that exceeded the method detection limit with concentrations up to 110 µg/L. Thirteen residential wells had a perchlorate concentration exceeding EPA's Drinking Water Equivalent Level (DWEL) of 24.5 µg/L. Of the thirteen residential wells exceeding 24.5 µg/L, the New Jersey Department of Environmental Protection (NJDEP) installed pilot treatment systems at two of these residences, one residence was sampled by EPA in October 2006 and the subsequent analytical results indicated the perchlorate concentration was less than 24.5 µg/L and one resident would not allow EPA to sample their well. The other nine residences, with well water perchlorate exceeding 24.5 µg/L, are the subject of this removal action.

C. Preliminary Assessment/Site Inspection Results

In 2003, the Park Ridge Borough collected supply well water samples for perchlorate analysis as required by the federally-mandated Unregulated Contaminant Monitoring Rule (UCMR). Perchlorate was detected at one sampling location at a level of 13 µg/L. At the time of the NJDEP referral to EPA, over 55 private wells had been sampled and analytical results indicated that 17 wells demonstrated perchlorate concentrations over 5 parts per billion (ppb). The highest concentration detected was 91 ppb.

From November 7 through November 9, 2005, EPA collected a total of 32 aqueous, potable well samples from 29 residential private wells. All samples were shipped to the EPA Region I, New England Laboratory for perchlorate analysis on November 9, 2005. Perchlorate analysis was conducted using High Performance Liquid Chromatography/Tandem Mass Spectrometry (HPLC MS/MS) technique (EIASOP-LCMSCIO4W1). The sample results for Saddle River ranged from non-detect to 16 µg/L. The sample results for Upper Saddle River ranged from non-detect to 6.2 µg/L. Of the 29 sample locations, 27 had results reported with detectable levels of perchlorate. The following table provides information on the sample collection and analytical

results.

Table 1: Well Water Sample Collection Information and Perchlorate Analytical Results
November 2005

Sample Location	Sample Result (µg/L)	Well Depth (ft)
Saddle River	6.7	100 *
Saddle River	0.85	125 *
Saddle River	ND	200
Saddle River	1.2	200 *
Saddle River	5.2	231
Saddle River	10	200–250*
Saddle River	10	Unknown
Saddle River	16	Unknown
Saddle River	7.4	Unknown
Upper Saddle River	4.2	105
Upper Saddle River	ND	126
Upper Saddle River	1.8	130
Upper Saddle River	0.84	150
Upper Saddle River	0.48	150
Upper Saddle River	0.31	150
Upper Saddle River	2.0	160
Upper Saddle River	0.44	160
Upper Saddle River	0.36	160
Upper Saddle River	4.5	200
Upper Saddle River	4.0	300
Upper Saddle River	0.49	500
Upper Saddle River	0.58	550
Upper Saddle River	6.2	550
Upper Saddle River	0.27	Unknown
Upper Saddle River	0.3	Unknown
Upper Saddle River	0.7	Unknown
Upper Saddle River	1.1	Unknown
Upper Saddle River	0.8	Unknown
Upper Saddle River	0.92	Unknown
Trip Blank	ND	

*The residents who provided this well depth figure were not certain of its accuracy.

ND: Nondetect

NJDEP provided EPA with a list of Site residents they previously sampled having reported perchlorate results approaching or exceeding 24.5 µg/L. From October 17 through October 19, 2006, aqueous, potable well samples were collected from a pre-treated water source in eleven residences on the aforementioned list provided by NJDEP. All samples were shipped to the EPA Region I New England Laboratory for perchlorate analysis on October 19, 2006. All of the sample locations had results reported with detectable levels of perchlorate and nine had results exceeding

EPA's DWEL for perchlorate of 24.5 µg/L. The following table provides information on the sample collection and analytical results.

Table 2: Well Water Sample Collection Information and Perchlorate Analytical Results
October 2006

Sample Location	Sample Result (µg/L)	Well Depth (ft)
Saddle River	41	220
Saddle River	39	245
Saddle River	37	300
Saddle River	17	Unknown
Saddle River	33	Unknown
Saddle River	44	Unknown
Upper Saddle River	42	101
Upper Saddle River	47	125
Upper Saddle River	16	Unknown
Upper Saddle River	91	Unknown
Woodcliff Lake	95	Unknown

On January 26, 2006, EPA released "Assessment Guidance for Perchlorate" (Guidance). Following the National Academy of Sciences' (NAS) National Research Council (NRC) review, EPA adopted a reference dose (RfD) for perchlorate of 0.0007 milligram/kilogram-day (mg/kg-day), and the Guidance applies the RfD to EPA's CERCLA program. This RfD leads to a DWEL of 24.5 µg/L or 24.5 ppb.

In sum, the primary contaminant of concern found in groundwater at the Site is perchlorate. The Removal Site Evaluation (RSE) completed by EPA documented the presence of perchlorate in many wells from which groundwater is extracted for potable purposes. The level of perchlorate detected in samples taken from nine of the potable wells sampled by EPA was in excess of the EPA DWEL of 24.5 µg/L. Its presence is indicative of some historical release(s) which may have occurred at or up gradient of the Site. One or more point and/or non-point sources of perchlorate contributed to the levels of perchlorate found in groundwater at the Site. The identity of these source(s) is, however, currently unknown.

Current Activities

1. Current Situation

NJDEP has installed pilot treatment systems at two residences having well water perchlorate levels exceeding 24.5 µg/L. NJDEP is in the process of retrofitting these two systems to improve their performance. NJDEP has indicated they may install two additional pilot treatment systems at residences having well water perchlorate levels exceeding 24.5 µg/L. EPA's Emergency and Rapid Response Services ERRS contractor has sent out an invitation for bid (IFB) to install point of entry treatment (POET) systems at the affected residences. The bid responses to the IFB are due on August 3, 2007, and the bid award date is August 8, 2007. Once the POET installation subcontract is awarded, the scheduling and installation of the systems will begin.

2. Removal activities to date

An IFB to install perchlorate POET systems was sent out to potential vendors as described above.

3. Enforcement

There are currently no verified sources from which perchlorate migrated into groundwater at the Site nor have any potentially responsible parties been discovered or notified to date.

Potential sources of perchlorate include the following:

1. one or more businesses which currently operate or which operated in the past at and in the vicinity of the Site which may have handled agricultural fertilizers containing perchlorate or perchlorate salts;
2. farms, other agricultural operations, or some other legacy non-point source(s) which applied large quantities of fertilizers in the past at or in the vicinity of the Site; and
3. other industrial operations which may have used perchlorate in the past at or up gradient from the Site.

Additional work is required to identify the specific sources of perchlorate which may have contributed to the levels of perchlorate found in groundwater at the Site.

Planned Removal Actions

To mitigate the threats posed by this Site, EPA will install POET systems in the nine residences where EPA documented perchlorate levels exceeding EPA's 24.5 µg/L guidance value. The POET systems consist of two vessels, or more if determined to be necessary, of resin (installed in series) to remove the perchlorate ion, and a series of valves to isolate various portions of the system and taps to collect samples from different stages of the system. Routine monitoring and maintenance is necessary to ensure proper system operation and perchlorate removal. Perchlorate removal efficiency will be monitored through a scaled sampling program. Treated well water will be sampled at system startup to ensure the system is working appropriately, at six months as an interim check and subsequently one year after system startup. Resin canisters will be switched out as necessary for proper system operation. A contingency is included for non-routine maintenance and emergency service of treatment systems. For budgeting purposes, maintenance and monitoring is planned for one year.

Next Steps

As noted above, once the POET installation subcontract is awarded, the scheduling and installation of the treatment systems will begin.

Key Issues

There are no nationally significant or precedent-setting issues.

Estimated Costs *

	Budgeted	Total To Date	Remaining	% Remaining
Extramural Costs				
ERRS - Cleanup Contractor	\$137,797.00	\$0.00	\$137,797.00	100.00%
RST/START	\$6,080.00	\$0.00	\$6,080.00	100.00%

Intramural Costs				
USEPA - InDirect	\$47,026.00	\$0.00	\$47,026.00	100.00%
Total Site Costs	\$190,903.00	\$0.00	\$190,903.00	100.00%

* The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The OSC does not necessarily receive specific figures on final payments made to any contractor(s). Other financial data which the OSC must rely upon may not be entirely up-to-date. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

epaosc.org/bergenperchlorate